**Amendments to the Claims**

Please amend the claims as indicated in the following listing of the claims, which replaces all prior versions of the claims in the application.

Claim 1 (Canceled).

Claim 2 (New) A semiconductor laser cavity, comprising:

first and second reflector assemblies;

a non-linear semiconductor material between the first and second reflector assemblies, wherein the non-linear semiconductor material includes at least three semiconductor active gain regions, and wherein the non-linear semiconductor material is for intracavity four-wave mixing of photonic radiation from the at least three semiconductor active gain regions.

Claim 3 (New) The laser cavity of claim 2, wherein the non-linear semiconductor material includes a cubic crystalline non-linear semiconductor material.

Claim 4 (New) The laser cavity of claim 3, wherein the cubic crystalline non-linear semiconductor material includes a cubic crystalline non-linear semiconductor material of class F43m.

Claim 5 (New) The laser cavity of claim 3, wherein the cubic crystalline non-linear semiconductor material includes a cubic crystalline non-linear semiconductor material of space group 216.

Claim 6 (New) The laser cavity of claim 2, wherein the non-linear semiconductor material includes GaAs.

Claim 7 (New) The laser cavity of claim 2, wherein the non-linear semiconductor material includes one of InAs, InP, and GaSb.

Claim 8 (New) The laser cavity of claim 2, further comprising a fourth semiconductor active gain region for producing photonic radiation, and wherein the non-linear semiconductor material is for intracavity four-wave mixing of the photonic radiation from the four semiconductor active gain regions.

Claim 9 (New) The laser cavity of claim 8, wherein the fourth semiconductor active gain region is included in the non-linear semiconductor material.

Claim 10 (New) The laser cavity of claim 2, wherein the first reflector assembly includes a polyhedral prism waveguide having a non-reflecting surface facing the first non-linear semiconductor material and having at least one totally-reflecting surface for transversly redirecting incident photonic emissions to a different longitudinal location of the polyhedral prism waveguide.

Claim 11 (New) The laser cavity of claim 10, wherein the polyhedral prism waveguide includes a corner cube polyhedral prism waveguide.

Claim 12 (New) The laser cavity of claim 11, wherein the second reflector assembly includes a quarter wave mirror stack.

Claim 13 (New) The laser cavity of claim 11, wherein the polyhedral prism waveguide includes a right-angle prism shaped polyhedral prism waveguide.

Claim 14 (New) The laser cavity of claim 11, wherein the polyhedral prism waveguide includes a conical prism shaped polyhedral prism waveguide.

Claim 15 (New) The laser cavity of claim 12, wherein the second reflector assembly includes a mirror stack.

Claim 16 (New) The laser cavity of claim 15, wherein the mirror stack includes a quarter wave mirror stack.

Claim 17 (New) The laser cavity of claim 10, wherein polyhedral prism waveguide includes fused silica.

Claim 18 (New) A method of intracavity four-wave mixing of photonic radiation, comprising:

providing a non-linear semiconductor material between two reflector assemblies of a laser cavity, wherein the wherein the non-linear semiconductor material includes at least three

semiconductor active gain regions such that photonic radiation from the at least three semiconductor active gain regions is four-wave mixed within the laser cavity by the non-linear semiconductor material